



# CoCo Seminar Series Spring 2017

## Positive and Negative Effects of Social Impact on Evolutionary Vaccination Game in Networks

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**Tuesday March 21st, 2017 2:00-3:00pm**  
**(note the irregular time)**

**Engineering Building H-9 (Knoll-MacDonald Commons / Watson Commons)**

Preventing infectious disease like flu from spreading to large communities is one of the most important issues for humans. One effective strategy is voluntary vaccination, however, there is always the temptation for people refusing to be vaccinated because once herd immunity is achieved, infection risk is greatly reduced. We study the effect of social impact on the vaccination behavior resulting in preventing infectious disease in networks. The evolutionary simulation results show that the social impact has both positive and negative effects on the vaccination behavior. Especially, in heterogeneous networks, if the vaccination cost is low, the behavior is more promoted than the case without social impact. In contrast, if the cost is high, the behavior is reduced compared to the case without social impact. Moreover, the vaccination behavior is effective in heterogeneous networks more than in homogeneous networks. This implies that the social impact puts people at risk in homogeneous networks. We also evaluate the results from the social cost related to the vaccination policy.

Dr. Genki Ichinose is an Assistant Professor in the Department of Mathematical and Systems Engineering at Shizuoka University, Japan, and a visiting scholar at the CoCo Research Center. His research interests include agent-based modeling, evolution of cooperation, computational social science, network science, and artificial life.

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